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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,322	03/25/2004	Thunnakart Boontarika	251000US90	5436

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EXAMINER

MARKHAM, WESLEY D

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

48

Office Action Summary	Application No.	Applicant(s)	
	10/808,322	BOONTARIKA ET AL.	
	Examiner	Art Unit	
	Wesley D Markham	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. **Claims 1 – 8** are currently pending in U.S. Application Serial No. 10/808,322, and an Office Action on the merits follows.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) (i.e., the certified copy of JP 2003-089529, filed on 3/28/2003), which papers have been placed of record in the file.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "2" in Figure 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Ogura et al. (JP 63-61201 A).
6. Regarding independent **Claim 4**, Ogura et al. teaches a method for manufacturing an optical element ("Purpose"), the method comprising (1) press molding a glass molding material at a specified temperature and molding pressure by using a pair of mirror-finished dies (i.e., a "pressing mold") in order to produce an optical element having a specified radius of curvature (i.e., a "desired shape") (press molding a heat-softened molding material in a pressing mold to form an optical element of desired shape, as claimed by the applicant) (Abstract), and (2) forming an antireflective film on the surface of the optical element obtained (Abstract), wherein the optical element is subjected to glow discharge ion bombardment in a vacuum vessel (i.e., "plasma cleaning") prior to forming the antireflective film (Abstract).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, and 3 (as it depends from Claims 1 and 2) are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Murata et al. (USPN 6,261,665).

10. Ogura et al. teaches all the limitations of **Claims 1, 2, and 3** (as it depends from Claims 1 and 2) as set forth above in paragraph 6, except for a method wherein the plasma cleaning (i.e., a step prior to forming the antireflective film) provides the optical element with a surface free energy of greater than or equal to 60 mJ/m², and the antireflective film is formed on the optical element having the aforementioned

surface energy. Specifically, Ogura et al. is silent regarding the specific surface energy of the optical element after the plasma cleaning. However, the plasma cleaning step of Ogura et al. is designed to improve the adhesiveness and durability of the subsequently deposited antireflective film on the optical element (Abstract). Murata et al. teaches that, in the art of producing an antireflective film-coated optical element, it is desirable to treat the transparent substrate (e.g., glass) by, for example, plasma treatment (i.e., as taught by Ogura et al.) in order to increase the surface energy of the transparent substrate, which improves the adhesion of the substrate to a subsequently deposited antireflective film (Col.4, lines 6 – 40). Murata et al. teaches that the surface energy of the treated substrate should be 50 dyne/cm or more in order to improve the adhesive strength (Col.4, lines 39 – 40). “50 dyne/cm or more” is equivalent to “50 mJ/m² or more” (unit conversion specifics omitted). This range of surface energy values taught by Murata et al. overlaps the applicant’s claimed range of “greater than or equal to 60 mJ/m²”. It would have been obvious to one of ordinary skill in the art to plasma treat / clean the press-molded optical element of Ogura et al. in order to increase the surface energy of the element to be 50 mJ/m² or more (a range that overlaps the applicant’s claimed range), as taught by Murata et al., and then coat the optical element having the aforementioned high surface energy with an antireflective film, with the reasonable expectation of successfully and advantageously improving the adhesive strength of the antireflective film to the optical element, as explicitly desired by Ogura et al., due to

Art Unit: 1762

the high surface energy of the element created by the plasma treatment (as taught by Murata et al.).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Petcan (USPN 4,494,344) and Suzuki et al. (USPN 4,699,640).

12. Ogura et al. teaches all the limitations of **Claim 6** as set forth above in paragraph 6, except for a method wherein the optical element obtained by press molding is stored in a clean atmosphere with a cleanliness class of less than or equal to 1,000 until formation of the antireflective film. However, Petcan teaches that, in the art of producing glass optical elements such as lenses, the glass should be stored in a clean room between the step of cleaning the glass and subsequent processing steps (Col.1, lines 8 – 10, Col.3, lines 11 – 13). Suzuki et al. teaches that clean rooms having a cleanliness class of 1,000 and 100 (i.e., “less than or equal to 1,000”, as claimed by the applicant) were known in the art at the time of the applicant’s invention, and the aforementioned cleanliness classes indicate an intermediate and high degree of cleanliness, respectively (Col.1, lines 6 – 26). In light of these teachings, it would have been obvious to one of ordinary skill in the art to store the press-molded and plasma treated / cleaned optical element of Ogura et al. in a clean room having a high degree of cleanliness (e.g., a cleanliness class of 1,000 or 100) until it is desired to deposit the antireflective film thereon in order to insure that no dust or other undesired material deposits on the previously plasma cleaned optical element surface and negates the desired effect of the plasma treatment (i.e.,

improving the adhesion of the subsequently deposited antireflective film) by contaminating the surface.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Murata et al. (USPN 6,261,665), in further view of Petcan (USPN 4,494,344) and Suzuki et al. (USPN 4,699,640).

14. The combination of Ogura et al. and Murata et al. teaches all the limitations of **Claim 5** as set forth above in paragraph 10, except for a method wherein the optical element obtained by press molding is stored in a clean atmosphere with a cleanliness class of less than or equal to 1,000 until formation of the antireflective film. However such a limitation would have been obvious to one of ordinary skill in the art based on the teachings of Petcan and Suzuki et al. (see paragraph 12 above).

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Sato et al. (USPN 5,851,252).

16. Ogura et al. teaches all the limitations of **Claim 8** as set forth above in paragraph 6, except for a method wherein the molding material has a carbon-containing film on an outer surface thereof. However, the overall process of Ogura et al. involves press molding an optical glass element (Abstract). Sato et al. teaches that, in the art of press molding an optical glass element (i.e., a process analogous to that of Ogura et al.), it is desirable to deposit a carbon film on the surface of the molding material

prior to press molding in order to improve the releasability of the mold and the molded article with respect to each other (i.e., preventing the mold and the article from fusing together during the molding process) (Abstract, Col.1, lines 13 – 41, Col.2, lines 58 – 63, Col.3, lines 41 – 50, Col.4, lines 1 – 2 and 50 – 64, and Col.5, lines 1 – 8). After press molding, the carbon film is easily removed from the molded article by plasma processing (Col.5, lines 9 – 13 and 35 – 37). Therefore, it would have been obvious to one of ordinary skill in the art to coat the outer surface of the optical glass molding material of Ogura et al. with a carbon film prior to press molding, as taught by Sato et al., in order to advantageously improve the releasability of the mold and the molded article with respect to each other (i.e., preventing the mold and the article from fusing together during the molding process), thereby improving the quality of the molded optical product. Subsequent plasma cleaning (as taught by both Ogura et al. and Sato et al.) removes any residual carbon-contamination on the surface of the molded optical element.

17. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. in view of Murata et al. (USPN 6,261,665), in further view of Sato et al. (USPN 5,851,252).

18. The combination of Ogura et al. and Murata et al. teaches all the limitations of **Claim 7** as set forth above in paragraph 10, except for a method wherein the molding material has a carbon-containing film on an outer surface thereof. However such a

limitation would have been obvious to one of ordinary skill in the art based on the teachings of Sato et al. (see paragraph 16 above).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miyazaki et al. (JP 09-12340 A) teaches a method of producing an antireflective film having excellent adhesion and durability on an optical glass element produced by press molding. The method comprises cleaning the element with an acid or a base after press molding in order to improve the adhesion of the element to a subsequently deposited antireflective film. Crawley et al. (US 2003/0185973 A1) teaches treating the surface of an optical element with a water vapor plasma in order to increase the surface energy of the optical element.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


WDM

Wesley D Markham
Examiner
Art Unit 1762


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